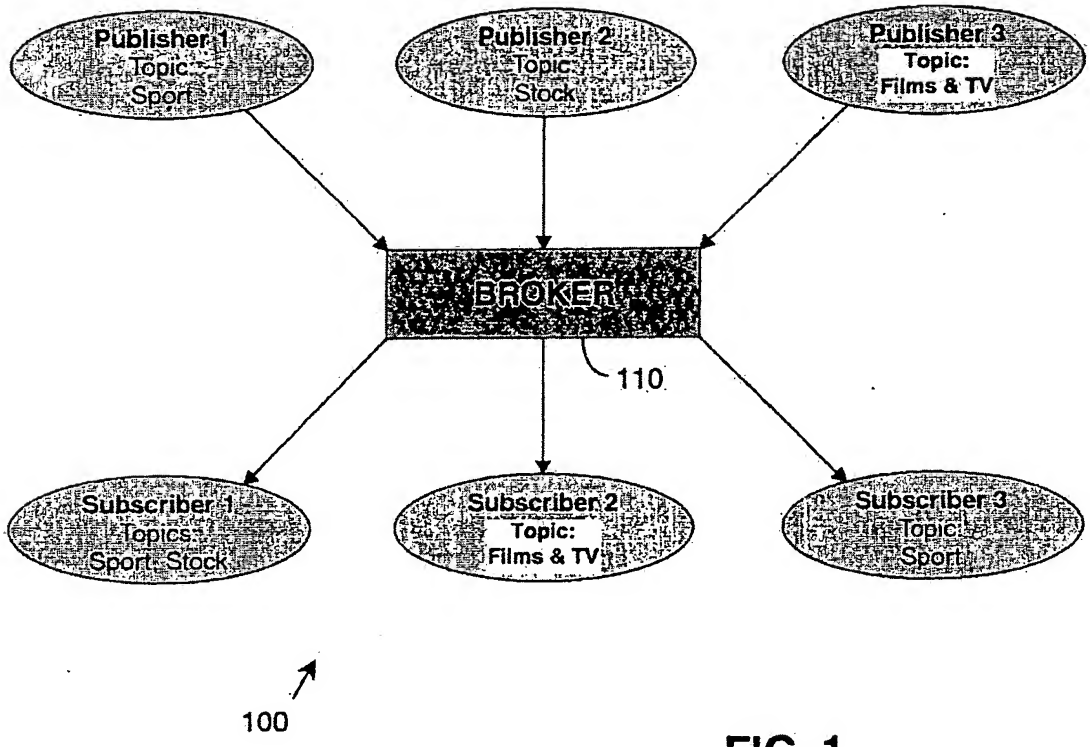

FIG. 1

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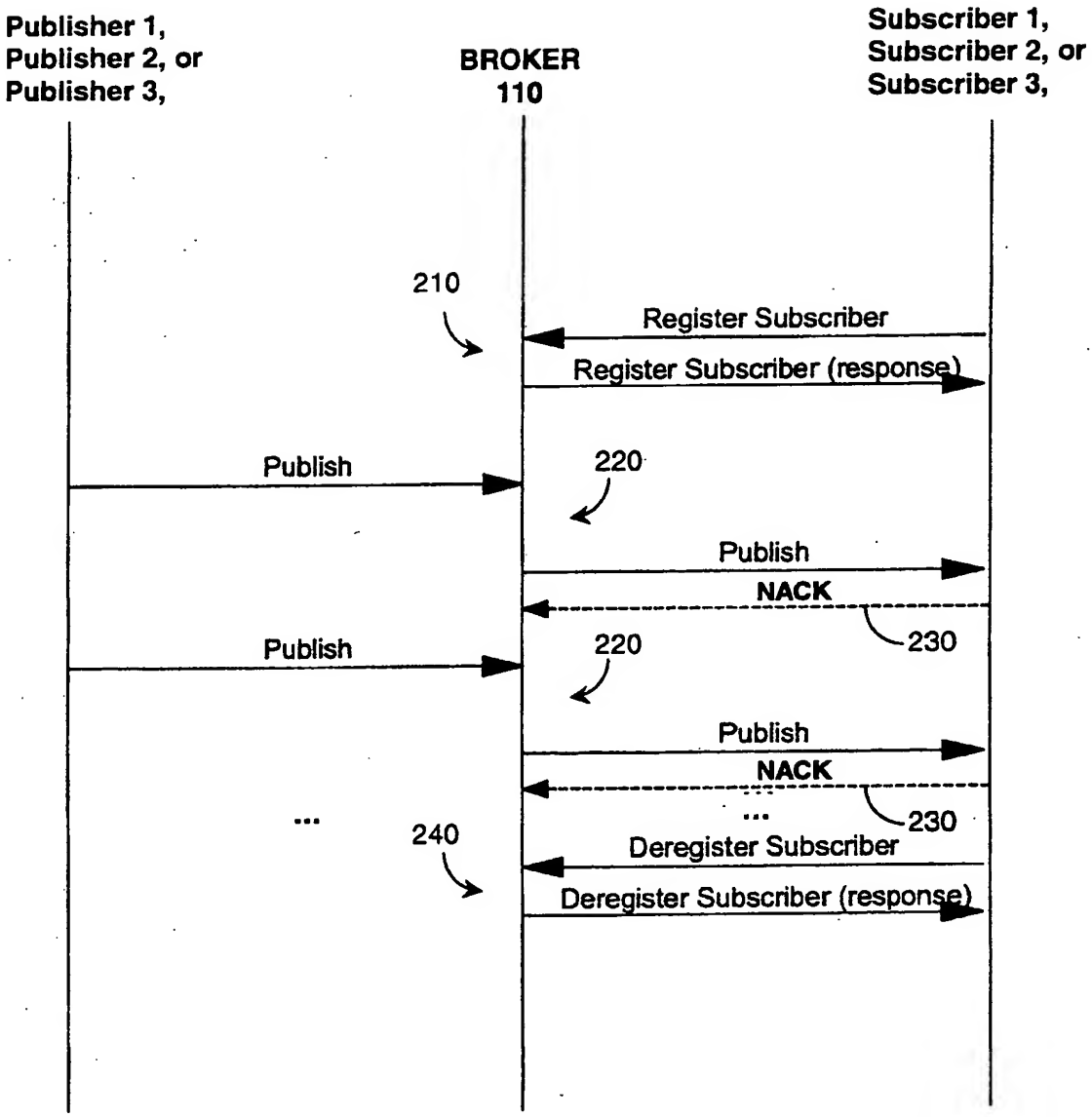

FIG. 2

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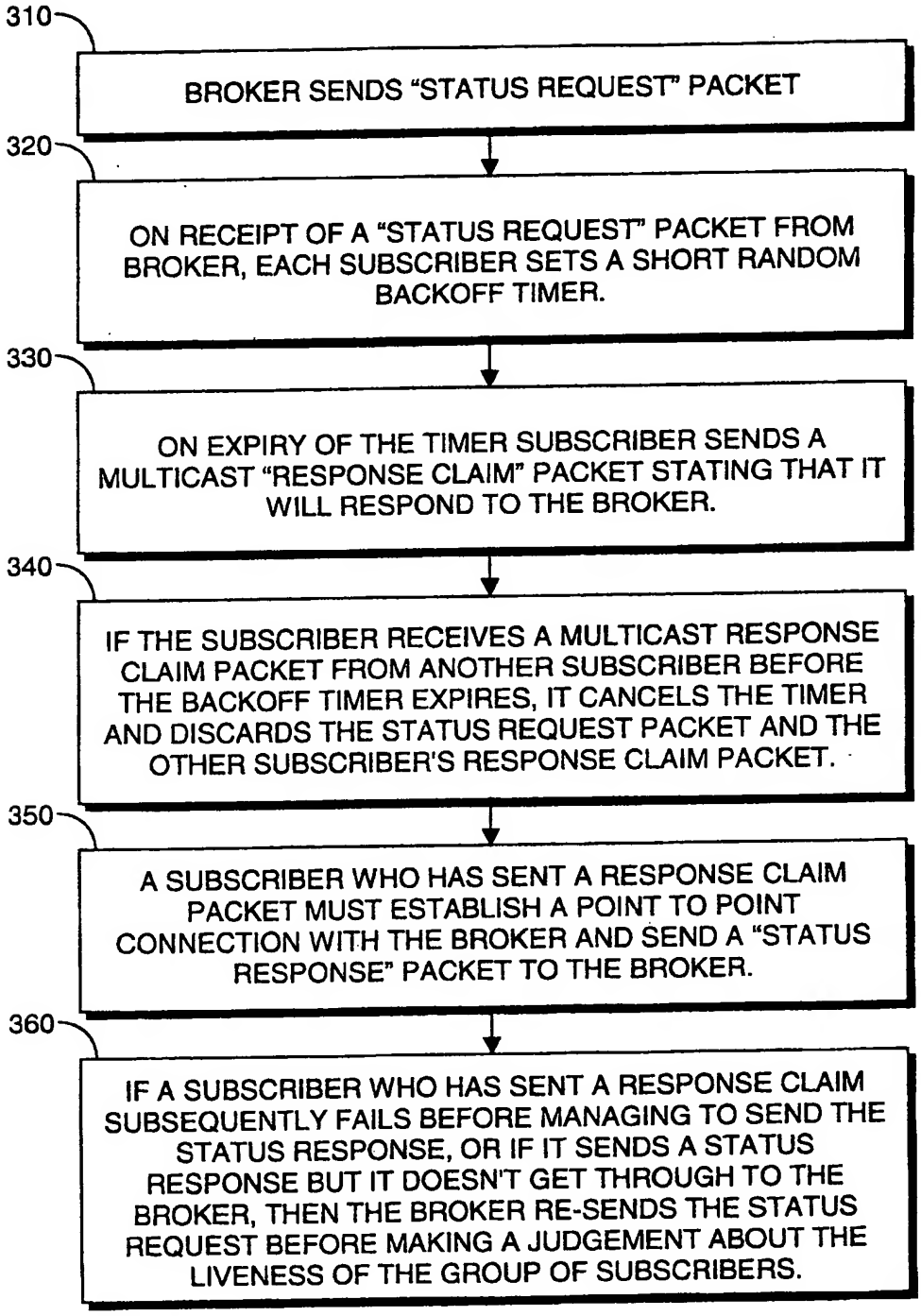
310
BROKER SENDS "STATUS REQUEST" PACKET
320
ON RECEIPT OF A "STATUS REQUEST" PACKET FROM BROKER, EACH SUBSCRIBER SETS A SHORT RANDOM BACKOFF TIMER.
330
ON EXPIRY OF THE TIMER SUBSCRIBER SENDS A MULTICAST "RESPONSE CLAIM" PACKET STATING THAT IT WILL RESPOND TO THE BROKER.
340
IF THE SUBSCRIBER RECEIVES A MULTICAST RESPONSE CLAIM PACKET FROM ANOTHER SUBSCRIBER BEFORE THE BACKOFF TIMER EXPIRES, IT CANCELS THE TIMER AND DISCARDS THE STATUS REQUEST PACKET AND THE OTHER SUBSCRIBER'S RESPONSE CLAIM PACKET.
350
A SUBSCRIBER WHO HAS SENT A RESPONSE CLAIM PACKET MUST ESTABLISH A POINT TO POINT CONNECTION WITH THE BROKER AND SEND A "STATUS RESPONSE" PACKET TO THE BROKER.
360
IF A SUBSCRIBER WHO HAS SENT A RESPONSE CLAIM SUBSEQUENTLY FAILS BEFORE MANAGING TO SEND THE STATUS RESPONSE, OR IF IT SENDS A STATUS RESPONSE BUT IT DOESN'T GET THROUGH TO THE BROKER, THEN THE BROKER RE-SENDS THE STATUS REQUEST BEFORE MAKING A JUDGEMENT ABOUT THE LIVENESS OF THE GROUP OF SUBSCRIBERS.

FIG. 3

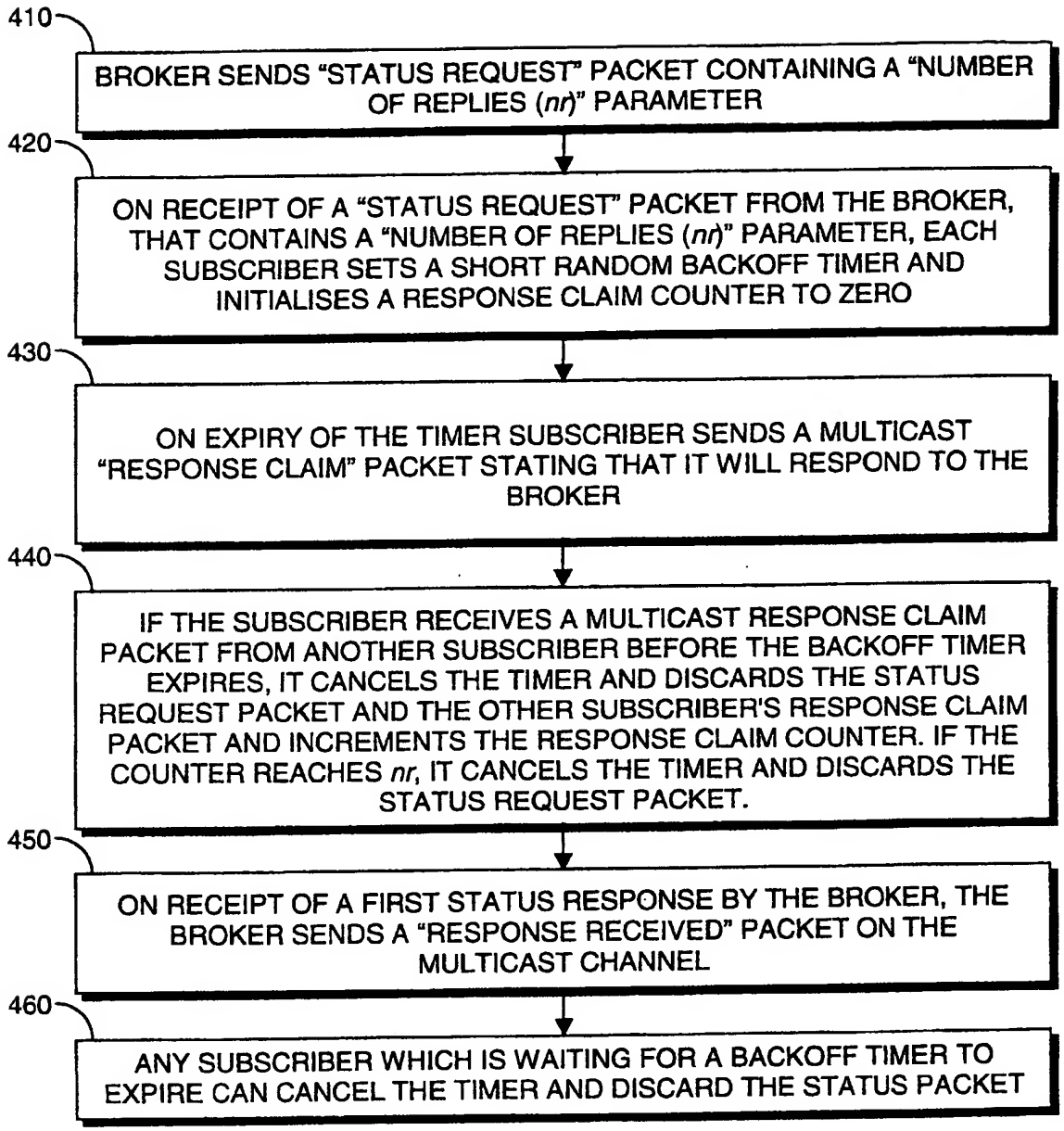
410
BROKER SENDS "STATUS REQUEST" PACKET CONTAINING A "NUMBER OF REPLIES (nr)" PARAMETER
420
ON RECEIPT OF A "STATUS REQUEST" PACKET FROM THE BROKER, THAT CONTAINS A "NUMBER OF REPLIES (nr)" PARAMETER, EACH SUBSCRIBER SETS A SHORT RANDOM BACKOFF TIMER AND INITIALISES A RESPONSE CLAIM COUNTER TO ZERO
430
ON EXPIRY OF THE TIMER SUBSCRIBER SENDS A MULTICAST "RESPONSE CLAIM" PACKET STATING THAT IT WILL RESPOND TO THE BROKER
440
IF THE SUBSCRIBER RECEIVES A MULTICAST RESPONSE CLAIM PACKET FROM ANOTHER SUBSCRIBER BEFORE THE BACKOFF TIMER EXPIRES, IT CANCELS THE TIMER AND DISCARDS THE STATUS REQUEST PACKET AND THE OTHER SUBSCRIBER'S RESPONSE CLAIM PACKET AND INCREMENTS THE RESPONSE CLAIM COUNTER. IF THE COUNTER REACHES nr, IT CANCELS THE TIMER AND DISCARDS THE STATUS REQUEST PACKET.
450
ON RECEIPT OF A FIRST STATUS RESPONSE BY THE BROKER, THE BROKER SENDS A "RESPONSE RECEIVED" PACKET ON THE MULTICAST CHANNEL
460
ANY SUBSCRIBER WHICH IS WAITING FOR A BACKOFF TIMER TO EXPIRE CAN CANCEL THE TIMER AND DISCARD THE STATUS PACKET

FIG. 4

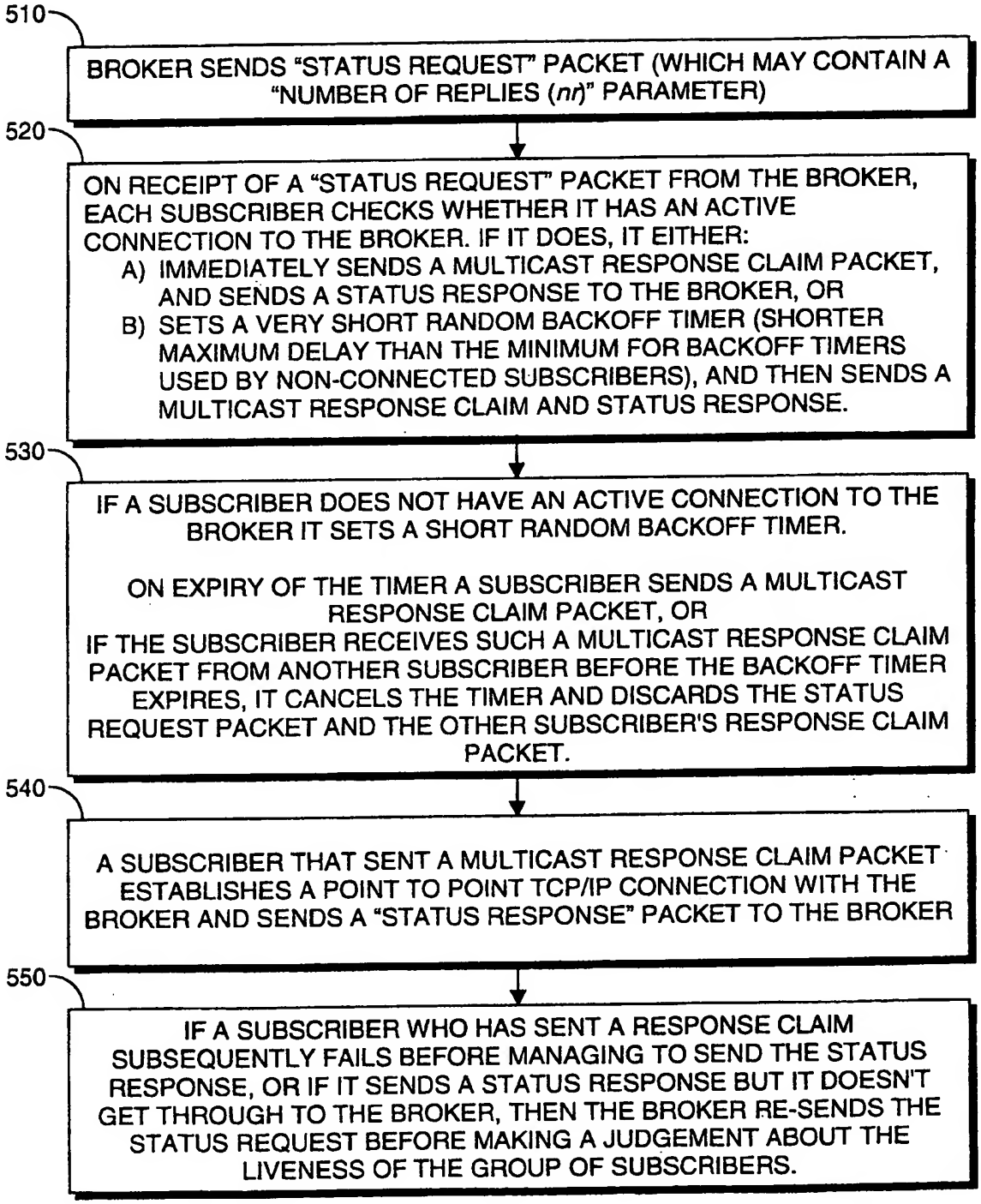
510
BROKER SENDS "STATUS REQUEST" PACKET (WHICH MAY CONTAIN A "NUMBER OF REPLIES (nr)" PARAMETER)
520
ON RECEIPT OF A "STATUS REQUEST" PACKET FROM THE BROKER, EACH SUBSCRIBER CHECKS WHETHER IT HAS AN ACTIVE CONNECTION TO THE BROKER. IF IT DOES, IT EITHER:
A) IMMEDIATELY SENDS A MULTICAST RESPONSE CLAIM PACKET, AND SENDS A STATUS RESPONSE TO THE BROKER, OR
B) SETS A VERY SHORT RANDOM BACKOFF TIMER (SHORTER MAXIMUM DELAY THAN THE MINIMUM FOR BACKOFF TIMERS USED BY NON-CONNECTED SUBSCRIBERS), AND THEN SENDS A MULTICAST RESPONSE CLAIM AND STATUS RESPONSE.
530
IF A SUBSCRIBER DOES NOT HAVE AN ACTIVE CONNECTION TO THE BROKER IT SETS A SHORT RANDOM BACKOFF TIMER.
ON EXPIRY OF THE TIMER A SUBSCRIBER SENDS A MULTICAST RESPONSE CLAIM PACKET, OR
IF THE SUBSCRIBER RECEIVES SUCH A MULTICAST RESPONSE CLAIM PACKET FROM ANOTHER SUBSCRIBER BEFORE THE BACKOFF TIMER EXPIRES, IT CANCELS THE TIMER AND DISCARDS THE STATUS REQUEST PACKET AND THE OTHER SUBSCRIBER'S RESPONSE CLAIM PACKET.
540
A SUBSCRIBER THAT SENT A MULTICAST RESPONSE CLAIM PACKET ESTABLISHES A POINT TO POINT TCP/IP CONNECTION WITH THE BROKER AND SENDS A "STATUS RESPONSE" PACKET TO THE BROKER
550
IF A SUBSCRIBER WHO HAS SENT A RESPONSE CLAIM SUBSEQUENTLY FAILS BEFORE MANAGING TO SEND THE STATUS RESPONSE, OR IF IT SENDS A STATUS RESPONSE BUT IT DOESN'T GET THROUGH TO THE BROKER, THEN THE BROKER RE-SENDS THE STATUS REQUEST BEFORE MAKING A JUDGEMENT ABOUT THE LIVENESS OF THE GROUP OF SUBSCRIBERS.

FIG. 5